

copy. Also included is a correction of a newly discovered typographic error on Page 6 of the specification.

The insert in Page 5, Line 17, of the specification is substantially a copy of the language used at the end of the originally filed Claim 1 and therefore does not constitute new matter. This insert does not add anything to the paragraph starting at Line 16 of Page 5 that would not have been obvious to persons skilled in the art, but it serves to formalize the connection to the means or steps for achieving the claimed functions.

In the amended claims, the original subsidiary Claim 6 has been rewritten to include all the limitations of its parent Claim 1 and has then been substituted for the original parent claim. It was then further amended to remove the justified and highly appreciated objection to the term "amenable" raised on Page 5, Paragraph 9, of the Office action. The herein substituted more appropriate term "adapted" is consistent with the pretreatment of said outer surface to render it suitable for attachment of active elements, as in the original Claim 6 and as disclosed on Page 8, Lines 1-27, of the specification. This pretreatment distinguishes our claims clearly from the cited Tartagni patent on which the 35 USC 102 objections are based.

REPLIES TO OBJECTIONS

1. Objections Based on 35 USC § 112:

The above-amended sentence starting at Line 17, Page 5, of the specification appears to overcome the indefiniteness objections to Claim 1 cited on Page 2 of the Office Action.

The amended paragraph on Page 5 and the rest of the specification clearly disclose the claimed structural elements or functions, based on "appropriate electronic interrogation of each each pair of electrodes 3, 3'..." This single sentence

is all that is needed for persons skilled in the art to duplicate the claimed invention, especially in view of the other below-pinpointed disclosures in the specification, especially those highlighted by bold print:

Page 5, Lines 16-18: “The **impedances** of different parts of substance 6 **are measured by appropriate electronic interrogation** of each pair of electrodes 3, 3', and each impedance value is assigned to an adjustable scale of 0 to 255 for display.”

Page 5, Lines 21-24: “**Changes in the capacitance due to impedance changes at the outer surface of layer 1 are detected during interrogation of each capacitor pair 3, 3' at a selected alternating current frequency, e.g., at 500 Hz.**”

Page 6, Lines 4-6: “The **electric circuitry and software that services the array is similar to that disclosed in the afore-cited Tartagni patent** and displays the output of the sensor array as a grayscale image with a resolution of 1:256.”

Page 6, Lines 9-10: “The grayscale values can be used to image conductivity at high resolution without direct contact...”

Page 6, Lines 17-19: “By comparing the **computer images from the sensor array** with pictures of microscope images one can see the very sensitive response of the chip, which is expressed by the gray scale.”

Page 9, Lines 10-11: “**Each different pattern can be separately imaged by a programmed interrogation sequence.**”

Page 9, Lines 25-28: “...**by following changes in impedance patterns, it becomes possible to perform biochemical or biological imaging** in vivo on living tissue or on living cells or to monitor metabolic changes in real time or the progress of cryosurgery.”

The cited excerpts clearly disclose all the features cited in claim 1, including structural elements, either explicitly or by reference to what is known in the art, e.g., to the Tartagni patent, and thus appear to satisfy the requirements called for in the MPEP 2181 and the court cases cited therein, especially *in re Atmel Corp. v. Information Storage Devices, Inc.*, 198 F.3d 1374-1382, 53 USPQ2d 1225-1231 (Fed. Cir. 1999) and *Dossel*, 115 F.3d at 946-47, 42 USPQ2d at 1885. The following excerpts from the MPEP seem to confirm our argument that the specification, as amended, is in full compliance with 35 U.S.C. 112:

"In Atmel, the patentee claimed an apparatus that included a "high voltage generating means" limitation, thereby invoking 35 U.S.C. 112, sixth paragraph. The specification incorporated by reference a non-patent document from a technical journal, which described a particular high voltage generating circuit. The Federal Circuit concluded that the title of the article in the specification may, by itself, be sufficient to indicate to one skilled in the art the precise structure of the means for performing the recited function, and it remanded the case to the district court "to consider the knowledge of one skilled in the art that indicated, based on unrefuted testimony, that the specification disclosed sufficient structure corresponding to the high-voltage means limitation." Id. at 1382, 53 USPQ2d at 1231.

The disclosure of the structure (or material or acts) may be implicit or inherent in the specification if it would have been clear to those skilled in the art what structure (or material or acts) corresponds to the means (or step)-plus-function claim limitation. See Id. at 1380, 53 USPQ2d at 1229; *In re Dossel*, 115 F.3d 942, 946-47, 42 USPQ2d 1881, 1885 (Fed. Cir. 1997)."

" Under certain limited circumstances, the written description does not have to explicitly describe the structure (or material or acts) corresponding to a means- (or step-) plus-function limitation to particularly point out and distinctly claim the invention as required by 35 U.S.C. 112, second paragraph. See *Dossel*, 115 F.3d at 946, 42 USPQ2d at 1885... Rather, disclosure of structure corresponding to a means-plus-function limitation may be implicit in the written description if it would have been clear to those skilled in the art what structure must perform the function recited in the means-plus-function limitation. See *Atmel Corp. v. Information Storage Devices Inc.*, 198 F.3d 1374, 1379, 53 USPQ2d 1225, 1228 (Fed. Cir. 1999) (stating that the "one skilled in the art" analysis should apply in determining whether sufficient structure has been disclosed to support a means-plus-function limitation and that the USPTO's recently issued proposed Supplemental Guidelines are consistent with the court's holding on this point); *Dossel*, 115 F.3d at 946-47, 42 USPQ2d at 1885 ("Clearly, a unit which receives digital data, performs complex mathematical computations and outputs the results to a display must be implemented by or on a general or special purpose computer (although it is not clear why the written description does not simply state 'computer' or some equivalent phrase.)")."

It is therefore respectfully requested that the objections based on 35 USC 112 be reconsidered.

2. Objections Based on 35 USC § 102:

As noted above, the herein substituted more appropriate term "adapted" signifies a pretreatment of said outer surface to render it suitable for attachment of active elements, as disclosed on Page 8, Lines 1-27, of the specification. It does not convert former Claim 6 into a new claim, as the pretreatment called for by that claim requires that said surface be so adapted. This pretreatment distinguishes our claims clearly from the cited Tartagni patent on which the 35 USC 102 objections are based. The amended claim 1 [formerly claim 6] is therefore not anticipated by Tartagni, and neither are all the subsidiary claims.

It is therefore respectfully requested that the objections based on 35 USC 112 be reconsidered.

3. Objections Based on 35 USC § 103:

The Office Actions of both 11/29/2005 and 6/18/2004 refer to Stetter et al. without specifying which of the two Stetter patents of record, numbered 5,512,882 or 5,567,301, is being cited. Upon perusal of these patents it becomes obvious that it is the latter that is being referred to. Several cogent non-obviousness arguments were presented in our reply of September 2004, and these and further supporting arguments are contained in the attached declaration by Prof. William Buttner, an expert in the field of chemical and biological sensors and sensing. However, our thorough review of all the cited patents and of the disclosures and claims of the present invention has revealed an important feature of the invention missing from each of the cited patents which should by itself suffice to overcome any obviousness rejection. That feature, recited in Claim 1, reads as follows:

"a fluid-impervious layer separating said elements from said samples so as to prevent electrode fouling and having an inner surface facing said elements and an outer surface on which said samples are placed

and which is adapted to the attachment of active elements that can interact with said component or a derivative thereof..."

Neither of the Stetter patents disclose or suggest "a fluid-impervious layer separating said elements from said samples so as to prevent electrode fouling" and **no biochemical or chemical sensor having such a feature has been known prior to the present invention.** The discovery that such a sensor is feasible was therefore non-obvious, regardless of whether the sensor was to be used as a single unit or as part of a multi-sensors array. This is the key to the invention, as clearly pointed out in Lines 5-8 of Page 4 of the specification, and this is not disclosed or suggested by either the Stetter or the Tartagni patents. The latter patent only provides a practical means of packaging the present invention into a compact array of multiple units, but it has no other connection with chemical or biological sensing. In fact, all the sensor elements in Tartagni's patent are shown as pure capacitances, whereas each of the inventions of Stetter et al., including the present one, deal with impedances, i.e., combinations of electrical conductors (or resistors) and capacitances. Tartagni's physical device, appertains to the group of sensors which respond to pressure, temperature, force, stress, distance, and other physical variables, whereas Stetter and Penrose are disclosing a chemical and biochemical sensor that responds to molecules, molecular interactions, ion interactions, chemical and biochemical bonds and reactions. Not only are the forces and energy sources involved totally different, but so are the mechanism of operation and the origin of the signal. Tartagni gets an electrical output because of a bulk fingerprint placed near the surface. Stetter & Penrose obtain a signal because a specific surface layer attracts specifically a chemically distinguishable analyte (molecule, supramolecular structure, or cellular organism) that is chemically distinguishable from all other surrounding compounds in the matrix. The Tartagni patent is

therefore just about as relevant to the obviousness of the present invention as would be any well-known container that might be used to house or package any other non-obvious invention.

For these reasons, it is submitted that claim 1 and its subsidiaries do not involve a simple "application of Stetter's layers to Tartagni's chip" or to any other chip for that matter, but they deal rather with a neat way of packaging a non-obvious invention into a compact array resembling Tartagni's. A 35 USC § 103 rejection is therefore not valid in this case.

Assuming then that the above amendments and arguments overcome the cited objections, it is respectfully requested that the application be reconsidered.

Also attached is a check for \$60.-- in payment for a one-month extension of time for putting the application in condition for allowance.

Respectfully submitted by,



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CERTIFICATION OF MAILING

The undersigned hereby certifies that this response is about to be sent by first class or express mail addressed to

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on or about February 25, 2006.

S. Zaromb

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